Romic Environmental Technologies Corp.

AZD 009015389

Chandler, Arizona
TSD Facility

Attachment B

Sampling and Analysis Plan

Revision 2A

December 2004

TABLE OF CONTENTS

ATTACHMENT B – SAMPLING AND ANALYSIS PLAN

1. INTRODUCTION ... 1

1.1. Project Background ... 1
1.2. Project Schedule ... 1
1.3. Program Organization ... 2

2. CONTAMINANTS OF CONCERN ... 2

3. DATA QUALITY OBJECTIVES ... 3

3.1. Data Quality Objectives ... 3
3.1.1. Closure Performance Standards ... 4
3.1.2. Sampling to Confirm Decontamination of Structures, Systems, and Equipment ... 4
3.1.3. Sampling to Confirm that No Release has Occurred to the Environment ... 5
3.1.4. Waste Characterization Sampling for Disposal ... 6
3.2. Description of Sample Locations and Quantities ... 6
3.2.1. Concrete Structures ... 6
3.2.2. Tank Systems ... 7
3.2.3. Miscellaneous Process Equipment ... 8
3.2.4. Site Soil ... 9
3.2.5. Site Groundwater ... 10
3.3. Data Quality Indicators ... 10
3.3.1. Precision ... 11
3.3.2. Accuracy ... 11
3.3.3. Representativeness ... 11
3.3.4. Completeness ... 12
3.4. Analytical Methods and Detection Limits ... 12
3.5. Data Evaluation Procedures ... 12
3.6. Measurement/Data Acquisition ... 13
3.6.1. Sampling Collection Requirements ... 13
3.6.2. Monitoring Well Installation ... 16
3.6.3. Decontamination Procedures ... 18
3.6.4. Sample Preservation and Storage ... 18
3.6.5. Sample Packaging and Shipping Procedures ... 18
3.7. Sample Documentation and Custody Requirements ... 18
3.7.1. Field Sample Custody and Documentation ... 19
3.7.2. Laboratory Custody ... 20
3.8. Analytical Methods Requirements ... 21
3.9. Laboratory Quality Assurance/Quality Control Samples ... 21
3.10. Field Quality Control Samples ... 21
3.10.1. Field Duplicate Samples ... 21
3.11. Special Training Requirements/Certification ... 21
3.12. Documentation and Records ... 22
3.12.1. Training Activities ... 22
3.12.2. Facility and Laboratory Activities ... 22

4. ASSESSMENT AND OVERSIGHT 23

4.1. Nonconformance and Corrective Action 23
4.2. Assessments and Response Actions 24
4.3. Reports to Management 24

5. DATA VALIDATION AND USABILITY 24

5.1. Data Review, Validation, and Verification Requirements 24
5.2. Reconciliation with Data Quality Objectives 24

The Tables and Figures are presented
as separate sections following the main body of the text.

TABLES

Table B-1 Summary of Closure Sampling

Table B-2 Data Quality Indicators for Site Closure

Table B-3 Summary of Sample Container, Preservation, and Holding Time Requirements

Table B-4 Description of Sample Designation

FIGURES

Figure B-1 Overview of Closure Process for Romic Facility

Figure B-2 Overview of Closure Sampling and Analysis Program

Figure B-3 Romic Facility Containment Areas and Storage Tanks

Figure B-4 Guide to Establishing Sampling Grid

1. INTRODUCTION

This Sampling and Analysis Plan (SAP) presents the procedures that Romic Environmental Technologies Corp. (Romic) will use for the collection, analysis, and evaluation of environmental media samples for the planned closure of the hazardous waste management units at the Chandler Arizona facility (Facility). The SAP has been prepared as part of the Romic Closure Plan (Plan). The sampling program will include the collection, analysis and evaluation of the following samples:

- Hazardous waste characterization (HAZCAT) for disposition of existing waste inventory;
- Verification sampling to confirm decontamination of concrete pads, tank systems, and equipment;
- Sampling of wastewater and rinse water generated during closure for appropriate disposal;
- Soil sampling, including background samples, for evaluation of closure performance standards; and
- Groundwater sampling and monitoring, if needed, for evaluation of closure performance standards.

1.1. Project Background

Closure activities at the facility will be performed in accordance with 40 CFR 264 Subpart G. An overview of the closure process is shown on Figure B-1. Additional description of the closure activities is provided in the Plan. Major site closure activities include:

- Initial set up;
- Inventory elimination;
- Decontamination;
- Verification sampling;
- Isolate or demolish structures;
- Soil sampling and analysis;
- Groundwater sampling and analysis (if needed);
- Waste disposal (off-site); and
- Closure Certification.

1.2. Project Schedule

A project schedule is presented in Table J-3 in the Plan. Closure of the Facility is estimated to require approximately 51 weeks.

1.3. Program Organization

The responsibilities of key program personnel are as follows:

Closure Project Manager – Responsible for overall project execution and quality. The Closure Project Manager is responsible for management of all site personnel and contractors assigned with the task of closing the Facility, including training of staff, oversight, and supervision. The Closure Project Manager will direct all sampling activities and be responsible for assuring that representative samples are properly collected at the appropriate locations. In addition, the Closure Project manager will oversee that all samples are properly labeled, packaged and delivered to the analytical laboratory using appropriate chain-of-custody procedures.

Quality Assurance (QA) Manager – Responsible for reviewing, monitoring, auditing, and evaluating all sampling activities conducted during site closure. The QA Manager is responsible for the quality of data gathered, confirmation that the sampling was conducted in accordance with the SAP, and maintenance of the program database. In addition, the QA Manager will review and audit the contract analytical laboratory performance

Analytical Department Manager – Responsible for managing all day-to-day analytical activities. The Analytical Department Manager will direct the Closure project process control, environmental and contract laboratories and will be responsible for the timely reporting of data to ensure uninterrupted operation of the closure activities.

All site personnel will be responsible for identifying potential problems that may arise in the collection of environmental samples and the reporting of program data. Personnel will inform the supervisors of any such problems and be provided corrective actions. Problems that cannot be resolved immediately will be reported to the QA Manager, who will track, review, and verify the effectiveness of the corrective actions.

2. CONTAMINANTS OF CONCERN

The Facility receives a broad range of hazardous wastes for treatment and disposal management. The various treatment and disposal processes utilized and planned at the Facility include:

- Solids Consolidation
- Solvent Recycling:
- Ethylene Glycol Recycling
- Fuel Blending
- Wastewater Treatment (Planned)
- Neutralization (Planned)
- Inorganic Treatment (Planned
- “Off-Site” Transfer

The Facility also does the following waste management practices:

- Consolidation of Small Containers
- Can Crushing
- Aerosol Depressurization
- Drum Crush
- Truck Wash

A list of the hazardous wastes accepted by the Facility, including Listed wastes and characteristically hazardous waste, is provided in Item 10, the Hazardous Waste Permit Identificant Form (Part A), of this Part B Application. In general, the hazardous wastes accepted at the Facility include spent petroleum solvents, various liquid wastes, and sludges. The Facility does not accept PCBs. Based on this information, the following COCs are considered for this Facility:

- Volatile organic constituents;
- Semi-volatile organic constituents;
- Petroleum hydrocarbons;
- Corrosive liquids;
- Heavy metals; and
- Organochloride pesticides.

Formatted: Indent: Left: 0.25", Numbered + Level: 1 + Numbering Style: Bullet + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0.25"

3. DATA QUALITY OBJECTIVES

This section describes the technical approach for the closure sampling and analysis program, including the specific data quality objectives, closure performance standards and the respective sampling requirements for each data quality objective.

3.1. Data Quality Objectives

The objectives of this sampling and analysis program are to confirm that the site meets all closure performance standards at time of closure. This confirmation process will be accomplished by the following:

- Determination that all structures, tank systems, and associated equipment used in the Facility have been adequately decontaminated during closure;
- Verification that there have been no releases of hazardous materials from the Facility to the environment during its years in operation and during closure; and
- Adequately characterize all wastes collected and generated during closure for disposal at an appropriate off-site Treatment Storage and Disposal Facility (TSDF).

3.1.1. Closure Performance Standards

Site closure will be based on a combination of both “clean closure” and “risk-based closure” performance standards depending upon the specific hazardous waste management unit closed at the site. The hazardous waste management unit will be considered clean closed if any detectable metal constituents identified in 40 CFR 261 Appendix VIII are below background levels while detectable organic constituents are below EPA Region 9's Preliminary Remediation Goals (PRGs) or equivalent. A risk-based closure for a hazardous waste management unit will demonstrate through a human health and ecological risk assessment (HHERA) that any detectable hazardous constituents identified in 40 CFR 261 Appendix VIII will not impact any environmental media in excess of Agency-established criteria or equivalent. The risk-based clean-up standards will be developed at time of closure, using current toxicological protocols and site data collected at that time.

Clean closure performance standards may be based on non-detection levels for specific organic hazardous constituents. In this case, a non-detect value will be set at least to the practical quantitation limits (“PQL”) as established by Test Methods for Evaluating Solid Waste, SW-846, U.S. Environmental Protection Agency, Third Edition, November 1986 (“SW-846”) or equivalent. The use of non-detect for the clean closure performance standards will require that the certified contract laboratory conducting the analysis include the specific concentrations for non-detect based on the analytical instrument used to detect the constituent.

The performance standards for clean closure and risk-based closure will be agreed upon with the Regional Administrator prior to start of site closure. An independent professional engineer registered in the State of Arizona will monitor all closure activities to confirm that they are conducted in accordance with the Plan and that the performance standards are met.

3.1.2. Sampling to Confirm Decontamination of Structures, Systems, and Equipment

Surface sampling will be conducted on all concrete structures, tank systems, and associated equipment that have been decontaminated. Two types of surface samples will be collected at the Facility, wipe samples and chip samples. Wipe sampling will be used for structures, systems, and equipment that have impervious surfaces (e.g. metal, epoxy coated, or vinyl-lined). Chip sampling will be used for structures, systems, and equipment that have porous surfaces (e.g. wood, asphalt, or uncoated concrete).

Rinsate sampling may be also used to confirm that the surfaces of specific process equipment (e.g. piping, pumps, filters, etc.) have been properly decontaminated. All decontaminated equipment will be visually inspected for the presence of process residues. If process residues cannot be removed by repeated washing, then clean water will be poured over and through the affected area, collected and analyzed as an equipment rinsate sample.

The analytical results from the sampling will be compared to the respective closure performance standards for the respective hazardous waste management unit. If the structures, systems, or equipment meet the closure performance standard, then it may be removed from the site and potentially sold for reuse in another similar service. If the structures, systems, and equipment equipment cannot meet the closure performance standard, then it may be further decontaminated to meet the standard, or removed and disposed of off site at a TSDF as a hazardous waste.

3.1.3. Sampling to Confirm that No Release has Occurred to the Environment

The Plan assumes that all applicable Corrective Action requirements have been satisfied prior the initiation of closure activities. However, additional confirmation sampling and analysis of the site soils will be required prior to site closure. If sufficient documentation is not available at time of closure, groundwater sampling and analysis may also be required to confirm that no residual contamination is present from past activities at the Facility.

Following decontamination of the concrete structures, tank systems, and associated equipment, a comprehensive soil sampling program will be conducted at the site. The soil underlying secondary containment pads, building structures and tank systems will be sampled and analyzed to confirm that no significant residual contamination is present that exceeds the closure performance standards. The investigation will include an evaluation of the surface areas surrounding the buildings within the Facility boundaries. In addition, background soil samples will be collected and analyzed at the time of Facility closure. The analytical results of the background soil samples will be used to determine the closure performance standards for the site soils.

The analytical results of soil sampling will identify potential areas where remediation may be necessary as a result of past practices at the Facility. If confirmation soil samples have concentrations of hazardous constituents above the closure performance standards, then Romic will conclude that a release has occurred at the site. The impacted soil will be excavated and removed until additional confirmation samples indicate that the hazardous constituent concentrations are below the closure performance standards. In the event that significant soil contamination is present and attributed to the site, a Corrective Action may be developed and reviewed with the Regional Administrator.

In addition to soil sampling, sampling of the site groundwater to determine potential impacts from previous Facility operations may be required. A minimum of three groundwater monitoring wells may be installed at the site. The wells would be installed in a triangular arrangement to provide a determination of the groundwater gradient at the site. Additional monitoring wells may be installed at locations within the Facility where significant soil contamination was identified during site closure.

The groundwater in the wells will be purged prior to sampling. The groundwater samples will be collected using a Teflon™ bailer. A stainless steel chain or cable will be used to lower the sampling equipment into each well. Samples will be collected after the water level has recovered to 80% of its static level or 16 hours after completion of purging, whichever comes first.

If no significant contamination is detected in the site groundwater, the monitoring wells will be abandoned and closed. In the event that significant groundwater contamination is present and attributed to the site, a Corrective Action may be developed and reviewed with the Regional Administrator.

3.1.4. Waste Characterization Sampling for Disposal

Waste drums at the facility during closure will be inventoried in accordance with information on the hazardous waste labels and Romic's waste tracking numbers (see Section C of the Part B permit application). It is assumed that a small percentage of the drum inventory during closure will have labels that are illegible or non-existent. These drums will be subject to additional hazard categorization (HAZCAT) to identify the waste type and therefore, the appropriate disposal disposition. In addition, all wastewater generated during closure activities is expected to be collected into 55-gallon drums. The equipment decontamination wash water will require sampling and analysis to determine if it exhibits hazardous characteristics prior to on-site treatment or disposal. In addition, the sampling equipment rinsate samples will be analyzed to verify that the equipment was adequately decontaminated between sample collection locations.

The sampling of waste drums for HAZCAT will be per the standard procedures described under the Waste Analysis Plan included in Section C of the Part B permit. Samples are generally collected with a glass thief or dipper cup using appropriate PPE. The liquid samples are then transferred into an appropriate sample container for submittal to the contract analytical laboratory under strict chain-of – custody procedures.

3.2. Description of Sample Locations and Quantities

This section describes the location of the closure samples and the minimum quantities to be collected for each of hazardous waste management units. A summary of the estimated number, location, type, and matrix of the samples is shown in Table B-1, Summary of Closure Sampling.

3.2.1. Concrete Structures

The Facility has several concrete containment areas that will require verification sampling after the areas have been decontaminated. The concrete containment areas that may be present at the Facility at time of closure may include the following locations and are described in Figure B-3, Romic Facility Containment Areas and Storage Tanks:

- Drum Storage Building No. 1
- Drum Storage Building No. 2
- Rail Loading and Unloading Area
- Canopy Area
- East Bay Processing Area
- West Bay Processing Area
- Tankfarm A
- Tankfarm B

- Tankfarm C
- Tankfarm D
- Tankfarm E
- Tankfarm F
- Tankfarm G

A minimum of three concrete chip samples will be collected from each structure as appropriate and analyzed for the specific Contaminants of Concern (COCs). Samples will be collected from the floor surface of each containment area, with at least one sample collected from a central sump or central drainage point if present. Areas observed with extensive staining or impacted contamination following decontamination will also be sampled. Each sample will be widely spaced with no two samples collected from the same location.

Anaytical results from the concrete chip sampling will be compared to the closure performance standards. If the results are at or below the standards for each COC, then the containment area may be demolished and removed from the site, or marked, isolated and left in place. If the analytical results from the concrete chip sampling are above the closure performance standards, then the subject area may be decontaminated again and resampled, or the structure may be demolished and disposed of as a hazardous waste at an appropriately permitted off-site TSDF.

3.2.2. Tank Systems

Sampling in storage tank locations will be dependant upon whether the storage tank remains in place following decontamination. The following tanks may be present at the Facility at time of closure and are described in Figure B-3, Romic Facility Containment Areas and Storage Tanks:

- Tankfarm A
- Tankfarm B
- Tankfarm C
- Tankfarm D
- Tankfarm F

For tanks removed from the site, chip samples will be collected from the concrete containment area as described above, with an additional chip sample collected directly under the previous foundation of the tank. If the storage tank remains at the site, three concrete chip samples will be collected within the containment area with at least one chip sample loacated near the base of the tank.

Wipe samples will also be collected. At least three wipe samples will be collected from each tank surface and analyzed for the specific COCs. One wipe sample will be collected from each tank exterior wall. An additional wipe sample will be collected from each tank's interior wall. The third wipe sample will be collected from the interior floor of each tank. It is assumed that the interior of all storage tanks remaining at the site will be fullly decontaminated and purged prior to entry into each tank under confined space requirements. Any tank surface areas observed with extensive staining or impacted contamination following decontamination will also be wipe sampled.

Anaytical results from the wipe sampling will be compared to the closure performance standards. If the results are at or below the standards for each COC, then the storage tank may be demolished and removed from the site, or marked, isolated and left in place. If the analytical results from the wipe sampling are above the closure performance standards, then the storage tank may be decontaminated again and resampled, or the storage tank may be demolished and disposed of as a hazardous waste at an appropriately permitted off-site TSDF.

3.2.3. Miscellaneous Process Equipment

The Facility has several pieces of process equipment that handle hazardous wastes. The location of this equipment that may be present at the Facility at time of closure includes:

- Production Areas (process unit equipment)
- Tankfarm A (process unit equipment)
- Tankfarm E (process unit equipment
- Tankfarm G (process unit equipment)

Following decontamination, at least one wipe sample will be collected from each process unit and analyzed for the specific COCs. The wipe sample will be collected from the exterior surface of the process unit. Any equipment surface areas observed with extensive staining or impacted contamination following decontamination will also be wipe sampled.

Rinsate sampling may be also used to confirm that the surfaces of specific process equipment (e.g. piping, pumps, filters, etc.) have been properly decontaminated. All decontaminated equipment will be visually inspected for the presence of process residues. If process residues cannot be removed by repeated washing, then clean water will be poured over and through the affected area, collected and analyzed as an equipment rinsate sample.

Analytical results from the wipe and rinsate sampling will be compared to the closure performance standards. If the results are at or below the standards for each COC, then the process equipment may be demolished and removed from the site, or marked, isolated and left in place. If the analytical results from the wipe and rinsate sampling are above the closure performance standards, then the equipment may be decontaminated again and resampled, or the equipment may be demolished and disposed of as a hazardous waste at an appropriately permitted off-site TSDF.

3.2.4. Site Soil

A schematic overview of the soil sampling and analysis program during site closure is shown on Figure B-2. The soil sampling during site closure will consist of both confirmation sampling and background level sampling. Confirmatory soil samples will be collected at the Facility where there has been suspected or confirmed loss of secondary containment, or where there is other evidence that a release to underlying or adjacent soils may have occurred. The background level soil samples will be collected to develop the baseline concentrations of the inorganic COCs as part of the closure performance standards for site soil.

Confirmation soil samples will be collected from beneath each of the secondary containment areas. A minimum of five locations will be collected in a five-point arrangement, with four samples collected near the corners of the structure and one sample near the center of the structure. Additional sample locations within each concrete containment structure will be based on the most likely collection point of any contaminants, such as in floor sumps or under the previous location of storage tanks or process equipment. The locations of significant cracks or stains in the secondary containment systems will also be selected for additional soil sampling. Records of past repairs from the Facility's operating log will be reviewed during closure to select the sample locations.

Each sample location within the concrete containment structure will be initially prepared by first coring and removing a section of the concrete pad to allow access to the subsurface soils. Coring will not be required if the structure has been demolished and removed from the site prior to initiation of soil sampling. Sampling of storage tank locations will be dependant upon whether the tank remains in place. For containment areas where the tank remains at the site, one soil sample may be collected from under the tank foundation using horizontal drilling techniques if access is possible.

Additional confirmation samples will be collected across the general open operational areas of the Facility. These areas would include the open spaces between the various buildings and tankfarms, and the truck and trailer parking area with the roll-off bins on the eastern portion of the property. Sampling will be based upon a fixed square grid with 30-foot interval spacing. Additional soil sampling will be conducted in those areas observed to have ground surface staining and where past spills had been documented from the Facility's operating log. The conformational open operational area soil sampling grid will be based on Figure B-4, Guide to Establishing Sampling Grid.

Background level soil samples will also be collected from three separate locations at the Facility. The locations will be selected outside the Facilities' operational boundaries and will represent potential areas that have not been impacted by previous site operations. The analytical results of the background level soil samples will be used in the development of closure performance standards for the site soil. The background level soil samples will be collected from the locations shown in Figure B-5, Romic Background Level Soil Sampling Locations.

The background level will be determined by calculating the mean of the three background level samples collected plus two standard deviations. If confirmatory soil samples have concentrations of hazardous constituents that exceed the 99^{th} percentile of the background level concentration distribution, then Romic will conclude a release has occurred. The impacted soil will be excavated, if required, to meet the specified closure performance standard.

Excavation of impacted site soil will extend horizontally to approximately 1.5 meters (5 feet) and vertically to an elevation of approximately 1.5 meters (5 feet) below the elevation of the samples exceeding cleanup levels. Additional confirmation soil samples will then be collected from each of the excavation sidewalls and from the bottom of the over-excavation. This process will be repeated, as practical, until all soil areas meet the closure performance standards. Alternative remedial measures may also be used in lieu of excavation with approval. If soil contamination is determined to be relatively extensive at the time of site closure, then a Corrective Action may be developed and reviewed with the Regional Administrator.

Each soil sample will be collected at a depth just below surface grade, or the interface of the concrete containment system and the soil interface in native soils. Two additional soil samples will be collected at approximately 1 meter (3 feet) and 2 meters (6 feet) below surface grade at locations which are suspected to have a high probability of contamination present, such as those directly under storage tanks, concrete drainage sumps, and any stained areas. The soil samples will be collected using a hand auger or by a direct push technology (DPT) drilling rig (i.e., Geoprobe). Field duplicate soil samples and equipment decontamination final rinsate samples will be collected in conjunction with each sampling event.

3.2.5. Site Groundwater

If necessary, groundwater samples will be collected from three monitoring wells installed at the site. The location of the groundwater monitoring wells will be determined at time of closure, however they will generally be configured in a triangular pattern across the site to determine the groundwater gradient. Groundwater samples will be collected following purging of the monitoring wells. Analytical results from the groundwater sampling will be compared to the closure performance standards. If the results are at or below the standards for each COC, then the monitoring wells may be abandoned and properly closed. If the analytical results from the groundwater sampling are above the closure performance standards, then a Corrective Action for the site groundwater may be developed and reviewed with the Regional Administrator.

3.3. Data Quality Indicators

Data quality indicators for the program include “PARCC” (precision, accuracy, representativeness, completeness, and comparability) goals, and level of confidence requirements, as described in the following subsections. Additional information is provided in the Romic Laboratory Quality Assurance Procedure Manual (QAPM). The QAPM can be found in Appendix C-1 to Section C of this Part B Application.

3.3.1. Precision

Precision refers to the degree of agreement between duplicates expressed as relative percent difference (RPD). RPD is calculated by the following equation:

$$\text{RPD} = \frac{|D_2 - D_1|}{\left[\frac{(D_1 + D_2)}{2}\right]} \text{ x } 100\%$$

Where: D_1 is the value of the first sample result

D_2 is the value of the second sample result

Precision criteria are based on an evaluation of potential field and laboratory performance on samples of similar matrices.

3.3.2. Accuracy

Accuracy refers to the agreement between the amount of the analyte measured by the test method and the amount actually present expressed as percent recovery (%R) of surrogates and matrix spikes. Percent recoveries are calculated by the following equations:

Where: Q_a is the quantity added to the sample

Q_d is the quantity recovered during analysis

$$\text{Surrogate \%R} = \frac{Q_d}{Q_a} \text{ x } 100\%$$

Where: SA is the amount of spike added

SR is the sample result

SSR is the spiked sample result

$$\text{Matrix Spike \%R} = \frac{SS - SR}{SA} \text{ x } 100\%$$

Like precision, accuracy criteria are based on an evaluation of potential laboratory performance on samples of similar matrices.

3.3.3. Representativeness

Representativeness is the degree to which the sample data represent a characteristic of the measured population. It is a qualitative parameter most influenced by the design and effectiveness of the sampling program and the proficiency of the sampling personnel. The procedures specified in this plan are designed to assure representative samples are collected and handled in a manner that assures the results from analysis of the samples correctly characterize the media sampled.

3.3.4. Completeness

Completeness is expressed as the percentage determined from the number of acceptable results compared to number of expected results. Where necessary, samples will be reanalyzed, or if insufficient sample material remains, additional samples will be collected and analyzed to meet this requirement.

The precision, accuracy, representativeness, and completeness objectives for this sampling program are shown in Table B-2. For this sampling program, laboratory precision will be ensured through the analysis of laboratory duplicate samples and the total precision of the sampling and analysis process will be assessed by the collection and analysis of field duplicate samples. Analytical accuracy will be ensured through the use of matrix spike samples. Representativeness of the soil samples will be ensured through the use of a sample grid or pattern, a statistical assessment of the adequacy of the number of samples, and the use of consistent sampling procedures. Collecting a statistically significant number of samples will also ensure completeness.

3.4. Analytical Methods and Detection Limits

Based on a review of the previous hazardous wastes accepted at the Facility, Romic has selected the following analytical methods to determine the potential COCs that may be present during site closure:

- EPA Method 8260B for volatile organic constituents (VOCs);
- EPA Method 8270C for semi-volatile organic constituents (SVOCs);
- EPA Method 8440 for total recoverable petroleum hydrocarbons (TRPH);
- EPA Method 9045C for pH level;
- EPA Method 6010B for metals; and
- EPA 8081A for organochloride pesticides.

The analytical methods will be based on the Test Methods for Evaluating Solid Waste, SW-846, U.S. Environmental Protection Agency, Third Edition, November 1986 ("SW-846") or equivalent to evaluate the samples collected during closure. The detection limits for these methods will be set to at least the PQLs specified in SW-846.

3.5. Data Evaluation Procedures

Site closure may be based on a combination of both "clean closure" and "risk-based closure" performance standards depending upon the specific hazardous waste management unit closed at the site. The hazardous waste management unit will be considered clean closed if any detectable metal constituents identified in 40 CFR 261 Appendix VIII are below background levels while detectable organic constituents are below EPA Region 9's Preliminary Remediation Goals (PRGs) or equivalent.

Metals are reported as concentrations, so the cleanup levels for these analytes will be based on the 99th percentile of their concentration distribution in background soil samples. Procedures for evaluation of the data for clean closure is as follows:

- Determine Cleanup Levels
  - Collect and analyze background level soil samples (metals only).
  - Determine degree of data censoring (metals only).
  - Determine distribution of data (metals only).
  - Calculate mean and standard deviation of sample set (metals only).
  - Calculate required number of samples. Collect additional background samples as needed.
  - Calculate Cleanup Levels for each analyte (metals only).
- Compare Confirmatory Samples to Cleanup Levels
  - Collect and analyze confirmation sample.
  - If Cleanup Levels are exceeded, conduct additional decontamination/excavation and re-sample.
  - If Cleanup Levels are met, document results in area acceptance package.
  - Project Manager reviews sample results and statistical calculations and signs acceptance package for submittal to Professional Engineer.

A risk-based closure for a hazardous waste management unit will demonstrate through a HHERA that any detectable hazardous constituents identified in 40 CFR 261 Appendix VIII will not impact any environmental media in excess of Agency-established criteria or equivalent. If necessary, the risk-based clean-up standards will be developed at time of closure, using current toxicological protocols and site data collected at that time.

3.6. Measurement/Data Acquisition

This section provides the sampling and analysis procedures, including sample collection, documentation and custody, and analytical method requirements. These requirements ensure that appropriate methods are employed and documented.

3.6.1. Sampling Collection Requirements

This section describes the methodology for sampling each medium, the sampling equipment, decontamination procedures, sample container and preservation requirements, and sample handling and packaging procedures.

Chip Samples

Chip sampling will be performed on areas with porous surfaces such as asphalt, concrete, or wood. Chip samples will be obtained by chiseling out the top the top 2 cm of a 10 cm x 10 cm area and will represent an area of no more that 100 m^2. The chip samples will be transferred into appropriate laboratory-precleaned sample containers. All sampling equipment will be decontaminated before and after each use.

Wipe Samples

Wipe sampling will be performed on areas with smooth and impervious surfaces such as metal tanks, metal buildings, and epoxy coated concrete. Wipe samples will be obtained by using filter paper or gauze pads that are moistened with an appropriate solvent. The sampling material will be held in place by a pair of stainless steel forceps and is used to swab an area that is marked with a template. Wipe samples size will typically be 100 cm^2 and will represent an area of no more than 100 m^2. The wipe samples will be transferred into appropriate laboratory-supplied clean sample containers. All sampling equipment will be decontaminated before and after each use.

Soil Samples

Samples will be collected using either hand augers, shallow test pits, or direct push sampler (for example, Geoprobe). The borings will be continuously cored and boring logs generated. The field geologist will screen extracted soil cores for physical evidence of contamination (e.g., odors, chemical sheen, or discoloration). After the samples are collected, each boring will be backfilled with grout.

For direct push sampling, the soil samples will be removed from the sampling device, sealed with Teflon tape, capped, labeled, and placed in a pre-chilled ice chest. The soil samples from other sampling techniques will be transferred into appropriate laboratory-precleaned sample containers, and placed in a pre-chilled ice chest. If a sample of soil cannot be obtained at the exact location required because of boulders, loose sands, or other unfavorable conditions, a sample will be collected at a location adjacent to the prescribed location. Duplicate soil samples may be collected by dividing the sample. If the sample is too loose or otherwise not divisible, the sample will be homogenized and then divided into the duplicate pair. All sampling equipment will be decontaminated before and after each use.

Wastewater and Rinse Water Samples

Samples of liquids will consist of the sampling equipment rinsate fluids from the soil sampling program, decontamination confirmation rinsate samples, and the equipment decontamination wastewater samples. The equipment rinsate samples will be collected by pouring reagent-grade water over, or through, the equipment or item to be sampled. Where possible, the samples will be collected by pouring the rinsate directly into the final sample container. The sample container should be filled completely, excluding any headspace, and with a minimum of aeration. If transfers between containers, such as beakers or flasks, are required, these will be minimized to the extent possible. Disposable or laboratory-supplied clean containers will be used for the transfers if possible. Each time a rinsate sample is collected, it should be from a different equipment item that has been decontaminated for that specific day. Samples of wastewater will be collected from within the 55-gallon drums using a glass thief or dipping cup per the standard procedures described under the Waste Analysis Plan included in Section C of the Part B permit.

Groundwater Samples

The groundwater monitoring wells at the site will be developed and purged prior to sampling. The monitoring wells will be developed and purged using a combination of bailing, surging, and pumping. The fine-grained materials that may have accumulated in each well casing will be bailed from the well with a bailer until the bottom of the well casing can be probed. After bailing, the wells will be surged using a surge block to flush any fine-grained materials from the filter pack. The monitoring wells will then be bailed again to remove fine-grained materials until the bottom of the well casing can be probed.

After the second bailing, a submersible pump will be lowered down into each well and set in the lower portion of the submerged well screen. The pump will be started and the flow rate will be monitored using an in-line flow meter. The flow rates will be periodically checked and recorded. If the well is capable of yielding three well volumes, samples will be collected at regular intervals during the purging and tested for pH, electrical conductivity (EC), temperature, and turbidity. If sufficient recovery takes more than two hours, a groundwater sample will be collected separately for testing each parameter. Parameters will be measured quickly to minimize sample contact with the atmosphere. When parameters have stabilized within three well volumes (pH ± 0.1 pH units, EC ± 5% of previous reading, turbidity ± 10 NTUs, and temperature ±1°C), then a groundwater sample will be collected for laboratory analysis. If all of the parameters have not stabilized, then pumping will continue until six well volumes have been purged, or parameters have stabilized, whichever comes first.

Water purged from the monitoring wells during well development will be temporarily placed in 55-gallon drums. The drums will be transported to a holding area where the contents will be sampled for laboratory analysis. Samples will be collected from the drums using a glass thief or dipping cup per the standard procedures described under the Waste Analysis Plan included in Section C of the Part B permit

After the monitoring wells have been developed and purged, groundwater samples will be collected. Groundwater sampling will follow the techniques described in the *RCRA Ground Water Monitoring Technical Enforcement Guidance Document* (U.S. EPA, 1986) or equivalent. The groundwater samples will be collected using a Teflon™ bailer. A stainless steel chain or cable will be used to lower the sampling equipment into each monitoring well. Samples will be collected after the water level has recovered to 80% of its static level or 16 hours after completion of purging, whichever comes first.

Samples for VOCs will be collected by placing the Teflon™ sampling nipple into the bottom of the bailer and allowing the sample to flow directly into the sample container. Samples for VOCs will be collected in 40-mL glass bottles allowing no headspace. This will be accomplished by filling each bottle until a meniscus is over the top, and fitting the cap securely. Headspace will be checked by inverting the bottle and tapping the lid to see if any air bubbles are visible in the bottle. If an air bubble appears, the sample will be collected again in a new vial. VOC bottles will contain a hydrochloric acid (HCl) preservative to extend the holding time.

Samples collected for inorganic analysis will be collected by pouring from the top of the bailer, but will be placed in plastic or glass containers filled to the top. If preservatives are in the containers, they will not be allowed to overflow while filling. The samples will be collected in order of decreasing volatilization as VOCs, SVOCs, metals and other inorganics.

Temperature, pH, EC, and turbidity will be measured before and after sampling to document the stability of the water over the sampling period. Water levels will be measured after samples are collected and after monitoring well conditions have stabilized.

3.6.2. Monitoring Well Installation

The following section describes the procedures for installation of groundwater monitoring wells at the site. Monitoring Wells will be installed according to *Standard Practice for Design and Installation of Ground Water Monitoring Wells in Aquifers* (ASTM, 1990) and the *Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells* (U.S. EPA, 1991a).

Based on the anticipated depth to groundwater of approximately 100 feet bgs, three or more monitoring wells may be installed at the Facility using Air Rotary Casing Hammer Drilling (ARCH) drilling techniques. If site conditions vary greatly from anticipated conditions, then changes will be made and will be documented. A registered geologist, engineering geologist or professional engineer certified by the state of Arizona will supervise all drilling activities.

Soil samples will not be submitted for laboratory analysis of potential contaminants of concern during drilling activities due to the nature of sample collection from the ARCH rig cyclone. However, grab samples of soil will be collected for determining the lithologic structure approximately every 5 feet and at each change in lithology to the depth of first water. Ambient air will also be monitored during all drilling and sampling activities.

The wells will be completed using flush-threaded 4-inch-diameter well casing and screen. The well construction materials will consist of a lower 20-foot section of 0.020-inch slotted Schedule 5 Type 304 stainless steel wirewrap screen equipped with a stainless steel bottom cap, a middle 10-foot section of blank Schedule 5 Type 304 stainless steel casing, and an upper Schedule 80 polyvinyl chloride (PVC) blank casing extending to ground surface. The well screen will be installed such that it extends approximately 5 feet above and 15 feet below the measured static groundwater level.

All downhole drilling equipment will be decontaminated before it is used at the site and after completion at each monitoring well location. Screen and casing sections will be steam cleaned and wrapped in plastic for transportation to each well location. The casing will be kept covered with plastic sheeting to avoid contamination until it is assembled and lowered down into the borehole.

The well casing will be plumb, true, and centered in the borehole to ensure that it is straight. Two stainless steel centralizers will be placed at the bottom and the top of the well screen. No centralizers will be located along the blank casing to prevent possible bridging of bentonite pellets during their installation.

Once the casing is installed, a filter pack, consisting of acid-resistant, washed and graded Lonestar No. 3 Monterey silica sand, will be placed in the annulus between each well casing and the borehole wall. The sand will be furnished in sacks and will be clean and free of oil, acid, organic or other deleterious material. The filter pack will be placed from the total borehole depth to approximately 3 feet above the top of the respective well screen. The filter pack material will be slowly introduced into each borehole through a tremmie pipe extending down between the casing and the borehole. The filter pack will be periodically sounded to monitor the depth and to locate any points of bridging between the well casing and the borehole or auger wall. The filter pack may be consolidated with a tight-fitting transition tool to break any bridges if they are encountered.

An approximate 1-foot layer of fine transition sand will be installed above the filter pack. A 5-foot transition layer of bentonite pellets will then be installed above the filter pack and hydrated with potable water. The bentonite pellets will be allowed to hydrate for approximately one hour prior to installation of the surface seal. After the bentonite seal has hydrated, the surface seal will be installed to ground surface using a neat Type I Portland cement containing 3 to 5 % powdered bentonite added by weight. The bentonite will be free of any additives that may impact water quality. The surface seal will be pumped from the bottom of the borehole to the ground surface by using a temporary tremie pipe to maintain a continuous seal while periodically raising the drive casing.

The monitoring wells will be completed above surface grade. The casing at each well will be extended 2 to 3 feet above the ground surface. An 8-inch-diameter steel guard pipe will be placed over the well casing and seated in a 2-foot square by 4-inch thick concrete surface pad. The pad will be sloped away from the well casing. A lockable cap or lid will be installed on the guard pipe. A PVC slip cap will be placed on the inside well casing. The inside casing will be notched on the northern side for use as a water level measurement datum point. Each well will be clearly marked using paint or impact lettering. Figure 9-3 shows a typical monitoring well design for the above-grade completion. All monitoring wells will be secured with corrosion-resistant locks as soon as possible after drilling has been completed. The locks will either have identical keys or be keyed to a master key.

Following installation, the water levels in all monitoring wells at the will be measured using the procedures described in the *RCRA Ground Water Technical Enforcement Guidance Document* (U.S. EPA, 1986). Measurements will be taken after the wells have stabilized prior to any well development or purging activities. Each measurement event will occur within as short a time period as practical so that water levels are representative of a given period (estimated to be one day or less). The electric sounder will be used to measure the static water level depth if no immiscible layers are present. Measurements will be recorded as feet below the measuring point elevation (top of casing) to the nearest 0.01 foot, and recorded as mean sea level (msl).

Following purging and sampling, the groundwater monitoring wells may be closed and abandoned. Wells will be abandoned in accordance with procedures outlined by the the *Manual of Water Well Construction Practices* (U.S. EPA, 1975).

3.6.3. Decontamination Procedures

Proper decontamination of sampling equipment is essential to prevent accidental cross-contamination of samples. Sample collection equipment items that will require decontamination include reusable collection containers and trowels. A decontamination area will be designated and equipped with the necessary equipment (pressure-washer, wash buckets, brushes, spray bottles, potable water, distilled water, towels, etc.).

The following procedures will be used for the decontamination of nondisposable soil and liquid sampling equipment.

For small equipment items such as trowels or spoons:

- Scrub with a brush and potable water to remove visible contamination.
- Rinse with clean potable water.
- Dry with disposable towels.

Process equipment decontamination procedures are described in Section J 1.8.2 of the Closure Plan.

3.6.4. Sample Preservation and Storage

Following collection, the samples will be properly stored to prevent degradation of their integrity. Table B-4, Summary of Sample Container, Preservation, and Holding Time Requirements, summarizes the preservation and holding time requirements for analyses of the soil and liquid samples.

3.6.5. Sample Packaging and Shipping Procedures

This section describes the procedures for packaging and transporting the samples from the point of collection to delivery to the laboratory. Samples will be sealed in the appropriate sampling container using plastic tape or an equivalent. A chain-of-custody seal will be placed over the tape. The samples will be packed securely in an ice chest containing ice sealed in double plastic bags. All samples will be cooled to 4°C during storage and prior to transfer to the laboratory.

3.7. Sample Documentation and Custody Requirements

Each sample will be properly documented to facilitate timely, correct, and complete analysis of data. The documentation system is used to identify, track, and monitor each sample from the point of collection through final data reporting. Chain-of-custody is necessary if there is any possibility that the analytical data or conclusions based upon analytical data will be used in litigation. A sample is considered to be in a person's custody if it is: 1) in a person's physical possession, 2) in view of the person after taking possession, or 3) secured by that person so that no one can tamper with it.

3.7.1. Field Sample Custody and Documentation

Sample custody and documentation are necessary to demonstrate the integrity of the sample from time of collection until delivery to the process or offsite analytical laboratory. The documentation required includes logbooks, sample labels, custody seals (for offsite samples), and chain-of-custody forms.

Logbooks. Logbooks will document where, when, how, and from whom any vital program information was obtained. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. At a minimum, the following sampling information will be recorded:

- Sample location, station location, and description;
- Sample number;
- Sampler's name(s);
- Date and time of sample collection;
- Designation of sample as composite or grab;
- Type of sample (i.e., matrix);
- Type of sampling equipment used;
- Type of preservation used (if any);
- Shipping arrangements and airbill number (as applicable); and
- Recipient laboratory(ies).

Formatted: Indent: Left: 0.5", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25", Tab stops: 0.75", List tab + Not at 0.25"

Logbooks will be bound, ruled, and each page prenumbered. All entries in logbooks will be in indelible ink, and corrections will be made by striking out erroneous information and initializing the change. "White out" will not be used.

Labeling. All samples collected will be labeled in a clear, precise way for proper identification in the field and for tracking in the laboratory. The samples will have preassigned, identifiable, and unique numbers. At a minimum, the sample labels will contain the following information:

- Facility name;
- Sample number;
- Date of collection;
- Time of collection;
- Analytical parameter; and
- Method of preservation.

Formatted: Indent: Left: 0.5", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25", Tab stops: 0.75", List tab + Not at 0.25"

Custody Seals. Custody seals will be used to preserve the integrity of each sample container and cooler from the time it is collected until it is opened by the offsite laboratory. A custody seal will be placed on each sample container after collection such that it must be broken to open the container. Two or more custody seals will be signed, dated, and placed on the front and back of the sample cooler prior to transport. If samples are to be transported to the onsite laboratory, and analysis will be immediately performed, custody seals on the individual sample containers are not necessary.

Chain-of-Custody Records. Chain-of-custody forms will be used for all samples delivered to the process laboratory and offsite laboratories to ensure that the integrity of the samples is maintained. Each form will include the following information:

- Sample number;
- Date of collection;
- Time of collection;
- Analytical parameter;
- Method of preservative;
- Number of sample containers;
- Shipping arrangements and airbill number, if applicable;
- Recipient laboratory; and
- Signatures of parties relinquishing and receiving the sample at each transfer point.

Formatted: Indent: Left: 0.5", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.25", Tab stops: 0.75", List tab + Not at 0.25"

A coding system will be used to identify each sample and is described in Table B-4, Description of Sample Designation. The system will allow for quick data retrieval and tracking to account for all samples. The sample designation will be assigned at the time of sample collection and recorded on the sample label, and logbook, and will comprise three parts or fields:

- Part 1 of the sample designation consists of a field (two digits) indicating the sampling event (i.e., "BL" will be used for the background level soil sampling event);
- Part 2 is a four-digit field corresponding to the sample location (i.e, "TANKA" for Tankfarm A); and
- Part 3 is a three-digit field that corresponds to the sequential number of sample collection.

Duplicate sample will be given the next number in the sampling sequence.

3.7.2. Laboratory Custody

The laboratory is to document all transfers of each sample within the laboratory system (e.g., the transfer of the sample from the sample custodian to the analyst for obtaining a sample aliquot and then the transfer of the sample back to the sample custodian). Additionally, all transfers of all sample extracts and digests will be recorded. This may be accomplished through the use of a sample preparation sheet with a signature block for documenting the transfer of the samples or by using a separate digest/extract custody transfer form.

3.8. Analytical Methods Requirements

The contract analytical laboratory selected must be a State-certified laboratory for the specific test methods used during closure sampling.

3.9. Laboratory Quality Assurance/Quality Control Samples

Laboratory quality assurance requirements are specified in Section C, Appendix C-1, Quality Assurance Procedure Manual.

3.10. Field Quality Control Samples

QC samples will consist of field duplicate samples and equipment rinsates.

3.10.1. Field Duplicate Samples

Duplicate samples will be collected for use as a measure of the precision of the sample collection and analysis process. The duplicate will be submitted with minimal indication of the site it was taken from. Duplicates will be prepared following standard sampling and preparation techniques as described in this section. Duplicates will be collected and submitted to the laboratory at a frequency of one per day or 5 percent (i.e., 1 per 20) of routine samples, whichever is more frequent. The relative percent difference (RPD) between field duplicate pairs will be evaluated against the precision criteria to determine data acceptability.

3.11. Special Training Requirements/Certification

All personnel directly involved in sample collection, handling, analysis, and data evaluation will be provided with a copy of this SAP. The management of the participating field or laboratory organization will establish personnel qualifications and training requirements for the project. The Romic Project Manager will ensure each person participating in the project has the education, training, technical knowledge, and experience, or a combination thereof, to enable that individual to perform assigned functions. Training will be provided for each staff member as necessary to perform his or her functions properly. Personnel qualifications will be documented in terms of education, experience, and training, and periodically reviewed to ensure adequacy to current responsibilities. Examples of topics for which training is required, as applicable to the position, include:

- Safety;
- Quality Assurance Project Plan;
- Standard Operating Procedures (SOPs);

- General field sampling techniques;
- Specific sampling protocols;
- Equipment calibration and maintenance;
- Corrective actions;
- Data reduction and validation;
- Reporting;
- Records management;
- Demonstration of proficiency; and
- Project-specific requirements.

3.12. Documentation and Records

The following sections describe required documentation and records for training, field, and laboratory activities.

3.12.1. Training Activities

Training will be documented and records kept on file and readily available for review. Documentation of training may be accomplished by including a summary of the training and the topics or items covered at the top of the attendance sheet, and/or including a copy of the slides, handouts, etc. used in the training session.

3.12.2. Facility and Laboratory Activities

Records provide the direct evidence and support for the necessary technical interpretations, judgments, and discussions concerning program activities. These records, particularly those that are anticipated to be used in permitting documents, will directly support current or ongoing technical studies and activities and provide the historical basis for later reviews and analyses. Records will be legible, identifiable, and retrievable and protected against damage, deterioration, or loss. The discussion in this section outlines procedures for record keeping. Organizations that conduct sampling and analyses will develop appropriate record-keeping procedures that satisfy relevant technical and legal requirements.

Records will consist of bound notebooks with prenumbered pages, sample collection forms, personnel qualification and training forms, sample location figures/drawings, equipment maintenance and calibration forms, chain-of-custody forms, sample analysis request forms, and change request forms. All records will be written in indelible ink.

Procedures for reviewing, approving, and revising records will be clearly defined, with the lines of authority included. All documentation errors will be corrected by drawing a single line through the error so it remains legible and will be initialed by the responsible individual, along with the date of change. If appropriate, the reason for the change will also be indicated. The correction will be written adjacent to the error.

Records will include but will not be limited to the following:

Sample Collection

To ensure maximum utility of the sampling effort and resulting data, documentation of the sampling protocol, as performed, is essential. Sample collection records will contain, at a minimum, the names of persons conducting the activity, sample number, sample location, equipment used, ambient conditions, documentation of adherence to protocol, and unusual observations. The actual sample collection record will be one of the following: a bound field notebook with prenumbered pages, a preprinted form, or digitized information on a computer tape or disc.

Chain-of-Custody Records

The chain-of-custody, which involves the possession of samples from the time they are obtained until they are disposed of or shipped off site, will be documented.

QC Samples

Documentation for identification of QC samples, such as equipment rinsate blanks and duplicate samples, will be maintained.

Deviations

All deviations from procedural documents and the SAP will be maintained in the operating record. A nonconformance record will be generated for each and every deviation.

Reports

A copy of all reports issued and any supporting documentation will be retained.

4. ASSESSMENT AND OVERSIGHT

This section describes the data assessment and oversight program, including procedures for response actions, nonconformance correction actions, and reports to management.

4.1. Nonconformance and Corrective Action

Nonconformance and corrective action requirements are specified in Section C4.5 Incoming Waste Accepting Evaluation of the Part B Permit

4.2. Assessments and Response Actions

Assessments and response requirements are specified in Section C4.5 Incoming Waste Acceptance Evaluation of the Part B Permit.

4.3. Reports to Management

Reports to the Closure Project Manager will include the program progress, a summary of key performance indicators, a summary of the nonconformance and corrective actions, surveillance and audit findings, and data validation reports. Each report, as appropriate, will include a section that provides an overall assessment of the sampling and laboratory programs.

5. DATA VALIDATION AND USABILITY

This section describes the data assessment and oversight program, including procedures for data review, validation, and verification and reconciliation with data quality objectives.

5.1. Data Review, Validation, and Verification Requirements

Data review, validation, and verification requirements are specified in Section C, Appendix C-1, Quality Assurance Procedure Manual.

5.2. Reconciliation with Data Quality Objectives

Reconciliation with data quality objective requirements are specified Section C, Appendix C-1, Quality Assurance Procedure Manual.

TABLES

Table B-1
Summary of Closure Sampling

Sample Type	Matrix	Location	Estimated Minimum Quantity	Sample Designation	Analysis SW-846 8260B	SW-846 8270C	SW-846 8440	SW-846 9045C	SW-846 6010B	SW-846 8081A
Concrete Containment Structures										
Decon Confirmation	Chip	Drum Storage Building No. 1	3	CODRM1 (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Drum Storage Building No. 2	3	CODRM2 (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Rail Loading and Unloading	3	CORAIL (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Canopy Area	3	COCNPY (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	East Bay Processing Area	3	COEAST (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	West Bay Processing Area	3	COWEST (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm A	3	COTANKA (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm B	3	COTANKB (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm C	3	COTANKC (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm D	3	COTANKD (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm E	3	COTANKE (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm F	3	COTANKF (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Chip	Tankfarm G	3	COTANKG (001-003)	Yes	Yes	Yes	Yes	Yes	Yes

Estimated quantity does not include additional duplicate samples required.

Table B-1
Summary of Closure Sampling (cont.)

Sample Type	Matrix	Location	Estimated Minimum Quantity	Sample Designation	Analysis					
					SW-846 8260B	SW-846 8270C	SW-846 8440	SW-846 9045C	SW-846 6010B	SW-846 8081A
Tank Systems										
Decon Confirmation	Wipe	Tankfarm A (3 tanks)	9	DVTANKA (001-009)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm B (3 tanks)	9	DVTANKB (001-009)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm C (5 tanks)	15	DVTANKC (001-015)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm D (2 tanks, 4 tanks proposed)	18	DVTANKD (001-018)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm F (9 tanks proposed)	27	DVTANKF (001 -027)	Yes	Yes	Yes	Yes	Yes	Yes

Estimated quantity does not include additional duplicate samples required.

Tankfarm D currently has 2 tanks, those tanks will be moved to Tankfarms E and F and 4 new tanks installed under the proposed Part B Permit application.

Table B-1
Summary of Closure Sampling (cont.)

Sample Type	Matrix	Location	Estimated Minimum Quantity	Sample Designation	Analysis					
					SW-846 8260B	SW-846 8270C	SW-846 8440	SW-846 9045C	SW-846 6010B	SW-846 8081A
Miscellaneous Process Equipment										
Decon Confirmation	Wipe	Production Area (3 process units)	3	EQPROD (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm A (1 process unit)	1	EQTANKA (001)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm C (5 tanks)	5	EQTANKC (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm E (6 proposed process units)	6	EQTANKE (001-006)	Yes	Yes	Yes	Yes	Yes	Yes
Decon Confirmation	Wipe	Tankfarm G (2 proposed process units)	2	EQTANKF (001 -002)	Yes	Yes	Yes	Yes	Yes	Yes

Estimated quantity does not include additional duplicate samples required.

Table B-1
Summary of Closure Sampling (cont.)

Sample Type	Matrix	Location	Estimated Minimum Quantity	Sample Designation	Analysis					
					SW-846 8260B	SW-846 8270C	SW-846 8440	SW-846 9045C	SW-846 6010B	SW-846 8081A
Confirmation	Soil	Drum Storage Building No. 1	5	SODRM1 (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Drum Storage Building No. 2	5	SODRM2 (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Rail Loading and Unloading	5	SORAIL (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Canopy Area	5	SOCNPY (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	East Bay Processing Area	5	SOEAST (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	West Bay Processing Area	5	SOWEST (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm A	5	SOTANKA (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm B	5	SOTANKB (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm C	5	SOTANKC (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm D	5	SOTANKD (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm E	5	SOTANKE (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm F	5	SOTANKF (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Tankfarm G	5	SOTANKG (001-005)	Yes	Yes	Yes	Yes	Yes	Yes
Background	Soil	Non-Impacted Areas	3	BLSOIL (001-003)	Yes	Yes	Yes	Yes	Yes	Yes
Confirmation	Soil	Open Area Grid	40	SOGRID (001-040)	Yes	Yes	Yes	Yes	Yes	Yes

Estimated quantity does not include additional duplicate samples required.

Table B-2
Data Quality Indicators for Site Closure

Data Quality Indicator	Goal
Precision	±50% RPD for Field Duplicates ±35% RPD for Laboratory Duplicates
Accuracy	70 – 130% Recovery
Representativeness	NA
Completeness	95%

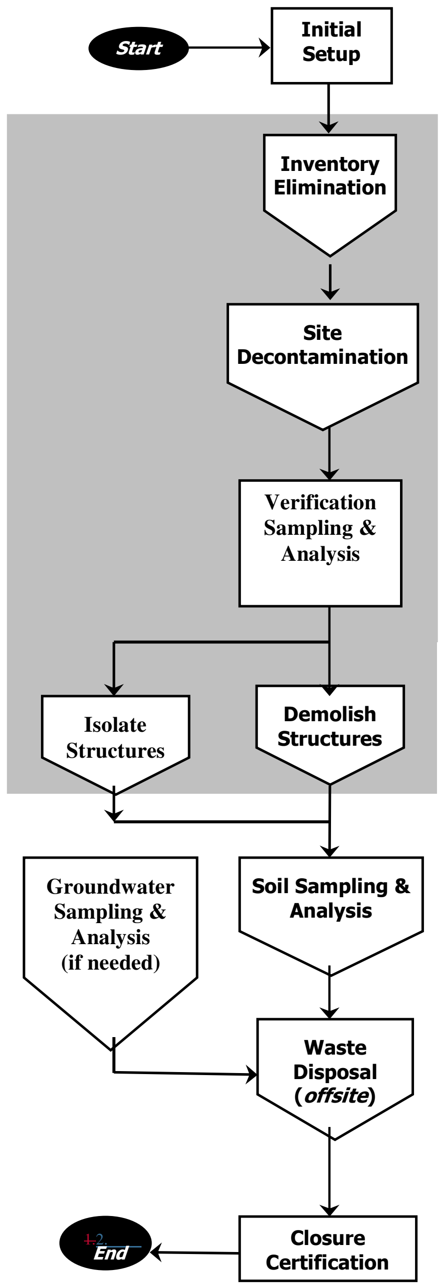
Table B-3
Summary of Sample Container, Preservation,
and Holding Time Requirements

Analyte and Method	Sample Matrix	Sample Container	Preservation	Maximum Holding Time
Volatile Organic Constituents (SW-846 Method 8260)	Solid	4-ounce clear wide mouth glass bottle	Cool to 4°C	14 days
Volatile Organic Constituents (SW-846 Method 8260)	Liquid	40 mL glass vial	$Na_2S_2O_3$, HCl to pH < 2, Cool to 4°C	14 days
Semi-Volatile Organic Constituents (SW-846 Method 8270)	Solid	8-ounce clear wide mouth glass bottle	Cool to 4°C	7 days to extraction; 40 days for analysis
Semi-Volatile Organic Constituents (SW-846 Method 8270)	Liquid	1-liter amber Boston Round glass bottle	008% $Na_2S_2O_3$, Cool to 4°C	7 days to extraction; 40 days for analysis
Total Recoverable Petroleum Hydrocarbons (SW-846 Method 8440)	Solid	4-ounce clear wide mouth glass bottle	N/A	Analyze ASAP
Soil and Waste pH (SW-846 Method 9045C)	Solid	4-ounce clear wide mouth glass bottle	N/A	Analyze ASAP
Soil and Waste pH (SW-846 Method 9045C)	Liquid	60-mL high density polyethylene bottle	N/A	Analyze ASAP
Metals (SW-846 Method 6010)	Solid	8-ounce clear wide mouth glass bottle	HNO_3 to pH < 2	6 months
Metals (SW-846 Method 6010)	Liquid	1-liter high density polyethylene bottle	HNO_3 to pH < 2	6 months
Organochloride Pesticides (SW-846 Method 8081A)	Solid	8-ounce clear wide mouth glass bottle	008% $Na_2S_2O_3$, Cool to 4°C	7 days to extraction; 40 days for analysis
Organochloride Pesticides (SW-846 Method 8081A)	Liquid	1-liter amber Boston Round glass bottle	008% $Na_2S_2O_3$, Cool to 4°C	7 days to extraction; 40 days for analysis

Table B-4
Description of Sample Designation

Sample Designation	Description
CODRM1001	The 1st confirmation sample for Drum Storage Building No. 1 containment structure
DVTANKA002	The 2nd confirmation sample for a Storage Tank in Tank Farm A
EQPROD001	The 1st confirmation sample for process equipment in the Production Area
SOCNPY003	The third confirmation soil sample collected in the Canopy Area.
BLSOIL001	The 1st background level soil sample collected.
CORINS004	The 4th confirmatory rinsate sample collected.
CORINS005	Duplicate of sample CORINS004, above.

Figures



- Notification of Site Closure
- Site preparation.
- Training of personnel.

- HAZCAT sampling of existing waste inventory.
- Removal of waste inventory to an appropriate off-site TSDF.

- Decontamination of concrete structures, tank systems, and equipment.
- Progressive decontamination and closure of hazardous waste management units.

- Collection and analysis of wipe and concrete chip samples.
- Collection and analysis of wastewater and rinse water samples.
- Analytical results compared to Closure Performance Standards.

- Demolition and removal of decontaminated structures.
- Salvage and recycling of decontaminated equipment and materials.
- Isolation of structures to remain on-site.

- Sampling of site soils under secondary containment structures and operational areas. Includes background samples.
- Soil analytical results compared to Closure Performance Standards.
- Excavation and removal of impacted soil, if needed.

- Transportation and disposal of wastes to an appropriate off-site TSDF.
- Installation and sampling of groundwater monitoring wells, if needed.
- Groundwater analytical results compared to Closure Performance Standards.
- Closure and abandon of monitoring wells.

- Registered Professional Engineer certifies closure conducted in accordance with EPA Region IX-approved Closure Plan.

Figure B-1
Overview of Closure Process for Romic Facility

Formatted: Indent: Left: -0.01", Hanging: 0.26", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

Formatted: Bullets and Numbering

Formatted: Indent: Left: 0", Hanging: 0.25", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

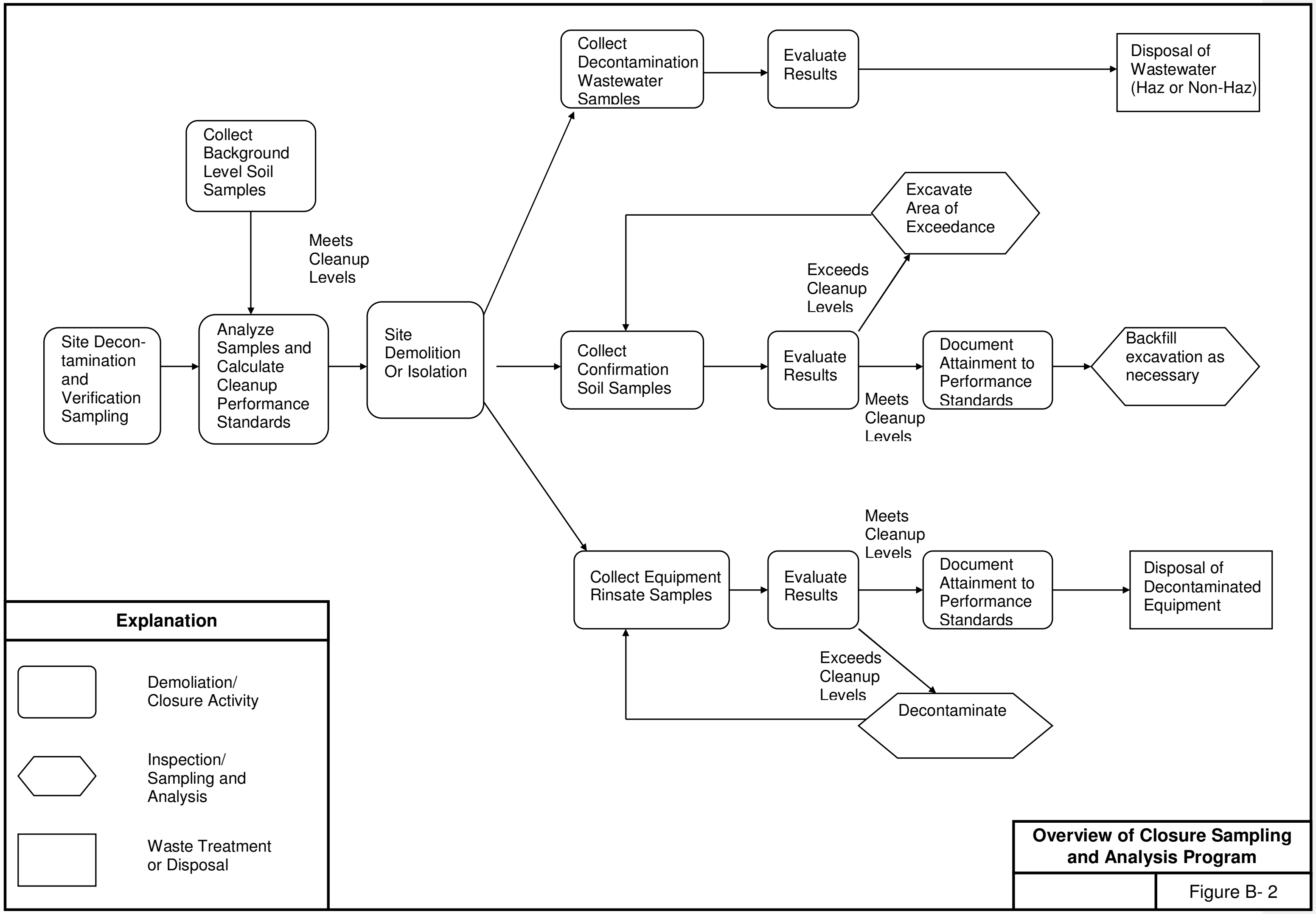
Formatted: Indent: Left: 0", Hanging: 0.25", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

Formatted: Indent: Left: 0", Hanging: 0.25", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

Formatted: Indent: Left: 0", Hanging: 0.25", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

Formatted: Indent: Left: 0", Hanging: 0.25", Bulleted + Level: 1 + Aligned at: 0" + Tab after: 0.25" + Indent at: 0.2"

Formatted: Bullets and Numbering

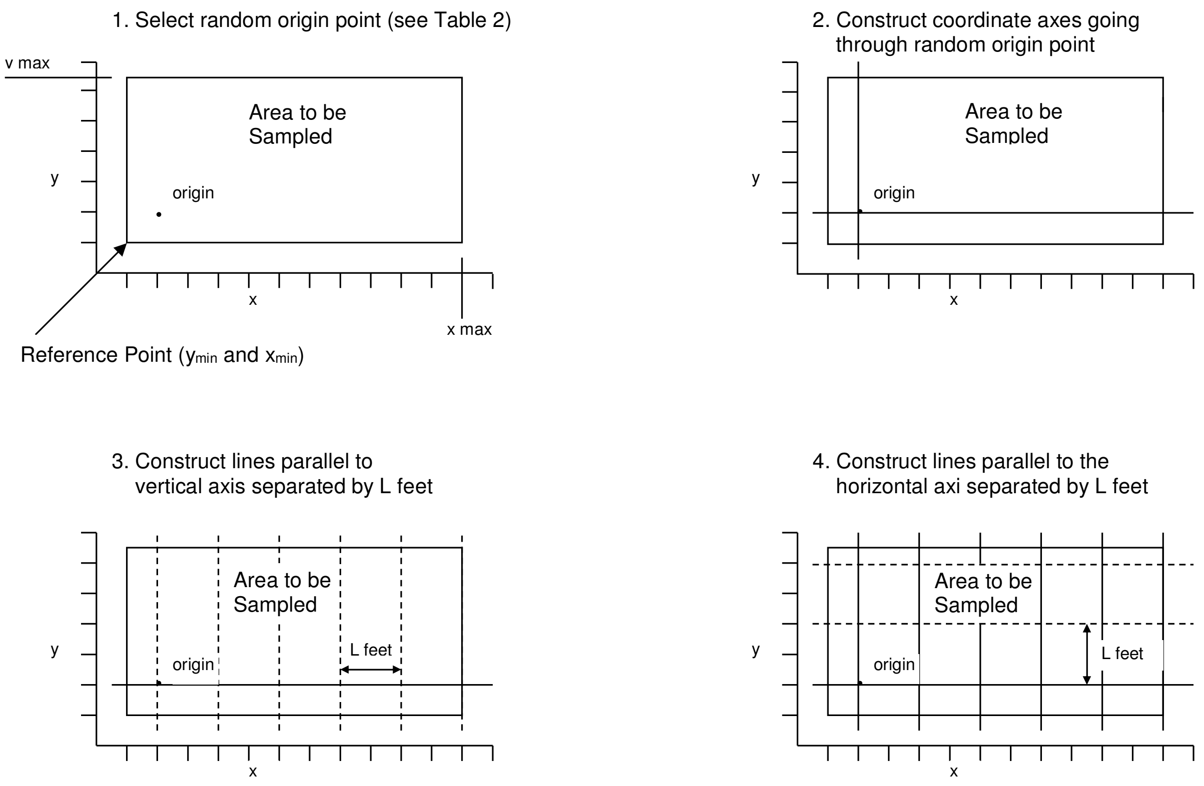


Overview of Closure Sampling and Analysis Program

Figure B- 2

Figure B-3
Romic Facility Containment Areas

Figure B-4
Guide to Establishing Sample Grid



NOTE:

Grid spacing (L) will be 30 feet for Romic open areas.

Guide to Establishing Sampling Grid	
	Figure B-4